In the Claims

Claim 1 (Previously presented): A method for identifying the sequence of a target polynucleotide, comprising:

(i) contacting the target polynucleotide with a polymerase enzyme and a nucleotide selected from the group consisting of A, T (U), G, and C, under conditions suitable for the polymerase reaction to proceed;

(ii) measuring the time taken for the polymerase to bind to and subsequently dissociate from the target polynucleotide, to thereby determine whether the polymerase has incorporated the nucleotide onto the target polynucleotide;

(iii) optionally repeating (i) and (ii) with additional nucleotides, to thereby identify the sequence of the target polynucleotide.

Claim 2 (Cancelled)

Claim 3 (Previously presented): The method according to claim 1, wherein (i) and (ii) are carried out with each of the different nucleotides in turn, until incorporation is detected.

Claim 4 (Previously presented): The method according to claim 1, wherein the target polynucleotide is immobilized on a support material.

Claim 5 (Previously presented): The method according to claim 1, wherein a plurality of target polynucleotides is immobilized on a support material.

Claim 6 (Previously presented): The method according to claim 1, wherein (ii) is carried out by measuring applied radiation.

Claim 7 (Previously prcsented): The method according to claim 1, wherein (ii) is carried out by measuring raman scattering.

Claim 8 (Previously presented): The method according to claim 1, wherein (ii) is carried out by applying a surface electromagnetic wave.

Claim 9 (Previously presented): The method according to claim 8, wherein the surface electromagnetic wave is a surface plasmon wave.

Claim 10 (Previously presented): The method according to claim 1, wherein detection is carried out by measurement of a surfacc electromagnetic wave.

Claim 11 (Previously presented): The method according to claim 1, wherein the polymerase comprises a detectable label attached thereto.

Claim 12 (Previously presented): The method according to claim 11, wherein the label is a fluorophore.

Claim 13 (Previously presented): The method according to claim 11, wherein the polymerase further comprises an energy donor label or an energy acceptor label, and wherein (ii) is carried out by measuring energy transfer between the fluorophore and the energy donor or acceptor.

Claim 14 (Previously presented): A method for the identification of a mutation in a target polynucleotide, comprising:

(i) contacting the target polynucleotide with a polymerase enzyme and a nucleotide selected from the group consisting of A, T (U), G, and C, under conditions suitable for the polymerase reaction to proceed;

(ii) measuring the time taken for the polymerase to bind to and subsequently dissociate from the target polynucleotide, to thereby identify whether the polymerase has incorporated the

nucleotide onto the target polynucleotide, and with reference to the native sequence of the target, determine whether a mutation exists.

Claim 15 (Previously presented): The method according to claim 14, wherein (i) and (ii) are carried out with each of the different nucleotides in turn, until incorporation is detected.

Claim 16 (Previously presented): The method according to claim 14, wherein a plurality of target polynucleotides is immobilized on a support material.

Claim 17 (Previously presented): The method according to claim 14, wherein (ii) is carried out by applying a surface electromagnetic wave.

Claim 18 (Previously presented): The method according to claim 17, wherein the surface electromagnetic wave is a surface plasmon wave.

Claim 19 (Previously presented): The method according to claim 14, wherein the polymerase comprises a detectable label attached thereto.

Claim 20 (Previously presented): The method according to claim 19, wherein the polymerase further comprises an energy donor label or an energy acceptor label, and wherein (ii) is carried out by measuring energy transfer between the fluorophore and the energy donor or acceptor.